1.045 Pollution Characteristics and Formation Mechanism of PM2.5 at Ningbo During the G20 Summit in 2016.

Early Career Scientist

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Abstract:

In this study we investigate two episodes of $PM_{2.5}$ at Ningbo during September 2016, which covered the G20 summit in 2016. Chemical components including water-soluble inorganic ions (WSII), black carbon (BC) and gaseous pollutants were measured. The mean hourly concentration of $PM_{2.5}$ was (21.20±11.68) μg m^{-3} with 14.0% exceeded 35 μg m^{-3} during September. WSII was the major component of $PM_{2.5}$ and accounted for (71.7±15.8) %. SO_4^{2-}, NO_3^-, and NH_4^+ (SNA) were the dominating components of WSII. In the first episode (E1, Sep. 1-10), strict control measures were implemented during Sep.

1-5. Concentrations of pollutants were higher during Sep. 1-3, which could be attributed to stable weather. During Sep. 4-5, concentrations of $PM_{2.5}$ and most species were decreased except Na^+. During this period, clean airmass coming from the ocean with higher wind speed was benefit for diffusion of $PM_{2.5}$ but contributed to the concentration of Na^+. Increment of $PM_{2.5}$ occurred when the summit concluded (Sep. 6-10). Lower wind speed and more sources were responsible for this increment. The formation of SNA contributed much to the formation of $PM_{2.5}$, which could be attributed to the gas-phase transformation and the heterogenous reaction. As for the second episode (E2, Sep. 11-20), $PM_{2.5}$, SNA and gaseous pollutants had significant reduction influenced by typhoon during Sep. 14-16, while the proportions and concentrations of Na^+, Ca^{2+}, and Mg^{2+} was higher for the sea salt and dust resulted by typhoon. Sep. 17-20 were still under the influence of typhoon, wind speed was still high while the wind direction changed to northwest, which brought some pollutants from the inland to Ningbo and lead to increasing of $PM_{2.5}$.